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Increasing the solubility of dipyridamole using polyethylene glycols

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Abstract

© 2014, IJPPS. All rights reserved. Objective: The objective of the present study is a determination of the limiting solubility of dipyridamole in water and optimal ratios of polyethylene glycol:dipyridamole at which formation of solid dispersion is observed. Methods: UV-spectroscopy was used to determine the effect of polymer on limiting solubility of dipyridamole. Using low-temperature differential scanning calorimetry (DSC), it was made possible to obtain solid dispersions of dipyridamole with polyethylene glycols having average molecular weight 1000 and 1400. Results: The optimal ratio of polymer:Drug is 1:1, and is 3:1 for PEG-1000 and PEG-1400 respectively. Joint dissolution of dipyridamole with PEG-1400 and PEG-1000 increases the drug content in the water by up to 8.1 times and up to 175 times, compared with the solution containing only dipyridamole. Conclusion: using systems based on dipyridamole and polyethylene glycol with average molecular weight of 1000, may increase the bioavailability of the drug and consequently reduce the dosages. Wide range of ratios, in which the formation of solid dispersions is possible, enables to adjust the solubility of dipyridamole in neutral aqueous media.

Keywords

Differential scanning calorimetry, Dipyridamole, Polyethylene glycol, Solid dispersion, Solubility in the water, UV spectroscopy